

# PRELIMINARY

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WA0FX-A

## POWER METER SET

**1. GENERAL.** This procurement requires a power meter set capable of measuring RF signal power levels.

**2. CLASSIFICATION.** Type II, Class 5, Style EP, and Color R in accordance with MIL-T-28800 for shipboard applications.

**3. MEASUREMENT REQUIREMENTS.** The power meter set shall indicate the RMS power of CW RF signals throughout the power and frequency ranges and within the minimum accuracies specified below. The power sensor may be either average or RMS responding. The power meter set shall not respond to pulsed RF signals.

**3.1 Power measurement range.** -60 dBm (1 nW) to +20 dBm (100 mW) full scale.

**3.2 Frequency response range.** 10 MHz to 18 GHz.

**3.3 Power meter.** A digitally indicating meter with at least 4-1/2 digits of resolution, an analog peaking meter or bar-graph equivalent, and the capability of averaging up to 128 measurements is required. The available power indication modes shall be dBm, dB relative, and Watts (prefixed with m,  $\mu$ , n, or p, as appropriate). The meter shall have high and low measurement limit settings and an audible warning for when the limits are exceeded.

**3.3.1 Power meter stability.** The power meter shall drift no more than  $\pm 1.5\%$  of full scale from zero set on the most sensitive range or  $\pm 100$  pW, irrespective of the sensor configuration, within 5 minutes of zero set in a non-averaging mode of operation.

**3.3.2 Zero set.** When automatic zeroing is not a function of the instrument, the power meter shall be provided with a control that permits zero adjustment.

**3.3.3 Power reference.** The power meter shall be provided with an internal power reference for adjusting the instrument to match the sensitivity of multiple power sensors. The power reference shall be 1 mW  $\pm 1.2\%$  for one year throughout the specified temperature range.

**3.3.4 Calibration factor control.** Provision shall be made to allow manual entry of power sensor calibration factors. Calibration factors may be contained in EEPROM in the individual sensors and automatically downloaded to the meter, or stored in user-alterable non-volatile RAM in the meter. When calibration data is stored in the meter, capacity shall be provided for data on at least 8 sensors.

**3.3.5 Recorder output.** The power meter shall be provided with a recorder-compatible output linearly proportional to the indicated power.

**3.4 Power sensor.** Sensors are required for the following power ranges; -60 to -20 dBm, and -25 to +20 dBm.

**3.4.1 Impedance.** 50 ohms, nominal.

**3.4.1.1 Maximum SWR.** 1.4:1

**3.4.2 Calibration factor graph.** The power sensors shall be provided with a graph of calibration factor

versus frequency mounted on the power sensor housing. The graph shall be compatible with the control specified in 3.3.4.

**3.4.3 Total measurement uncertainty.**  $\pm 2.0\%$  from 10 MHz to 8.0 GHz,  $\pm 4\%$  from 8.0 to 18.0 GHz. These values include instrumentation accuracy but do not include source mismatch.

**3.4.4 RF connector type.** Type N(m).

**3.4.5 Interconnecting cable length.** 1.5 meters (5 ft) minimum.

**3.4.6 Overload protection.** The power sensors shall be capable of withstanding a maximum power input of 200 mW continuous or peak.

**3.4.6.1 Overload indication.** The meter shall indicate an overrange condition when the rms power level exceeds the operating range of thermocouple sensors or the square law region of diode sensors.

#### **4. GENERAL REQUIREMENTS.**

**4.1 Power source.** MIL-T-28800 nominal power source requirements are invoked. Maximum power consumption: 25W.

**4.2 Weight.** 15 kg (33 lb) maximum.

**4.3 Digital interface.** A digital interface is required in accordance with MIL-T-28800.

**4.4 Lithium batteries.** Per MIL-T-28800, lithium batteries are prohibited without prior authorization. A request for approval for the use of lithium batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

**4.5 Transit case.** The Style P transit case shall provide protection for all components of the power measuring test set.